

REMARKS

The Office Action of August 1, 2007, has been received and reviewed.

Claims 1-39 and 41-67 are currently pending in the above-referenced application. Of these, claims 14-16, 27-30, 34-36, 41, and 45-67 have been withdrawn from consideration. Claims 1-13 17-26, 31-33, 37-39, and 42-44, which have been considered, stand rejected.

Reconsideration of the above-referenced application is respectfully requested.

Rejections under 35 U.S.C. § 102/103

Claims 1-10, 17, 19-26, 33, 37-39, and 42-44 have been rejected under 35 U.S.C. § 102(e) for being drawn to subject matter that is allegedly anticipated by the subject matter described in U.S. Patent Application Publication 2001/0013643 of Nakanishi et al. (hereinafter “Nakanishi”). Alternatively, claims 1-10, 17, 19-26, 33, 37-39, and 42-44 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter that is purportedly unpatentable over the teachings of Nakanishi.

A claim is anticipated only if each and every element, as set forth in the claim, is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

There are several requirements in establishing a *prima facie* case of obviousness against the claims of a patent application. All of the limitations of the claim must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* MPEP § 2143.03. Even then, a claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int'l Co. v. Teleflex Inc.*, No. 04-1350, slip op. at 14 (U.S. April 30, 2007). The Office must also establish that one of ordinary skill in the art would have had a reasonable expectation of success that the purported modification or combination of reference teachings would have been successful. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). There must also be an explicit, articulated “reason that would have prompted a

person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed and provided the person of ordinary skill with a reasonable expectation that the combination or modification of the prior art would have been successful. *KSR*, slip op. at 5; *see also*, *KSR*, slip op. at 14. That reason must be found in the prior art, common knowledge, or derived from the nature of the problem itself, and not based on the Applicant's disclosure.

DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co., 464 F.3d 1356, 1367 (Fed. Cir. 2006); M.P.E.P. § 2144. A mere conclusory statement that one of ordinary skill in the art would have been motivated to combine or modify reference teachings will not suffice.

KSR, slip op. at 14.

The Office has specifically relied upon the subject matter shown in FIG. 9 of Nakanishi in rejecting claims 1-10, 17, 19-26, 33, 37-39, and 42-44. FIG. 9 of Nakanishi illustrates a semiconductor device package that includes leads 9 with four semiconductor devices 1-4, two of which 1 and 2, 3 and 4 are stacked on each side of the leads 9. The semiconductor devices 1 and 2, 3 and 4 of each pair are spaced apart from each other by way of polyimide spacers 24. Paragraph [0078]. The polyimide spacer 24 between each pair of semiconductor devices 1 and 2, 3 and 4 is "preferably disposed along the periphery of the region where the semiconductor chips... are stacked in view of a high level of accuracy in the balance of the intervals between the semiconductor chips..." Paragraph [0080].

The two semiconductor devices 1 and 2, 3 and 4 of each pair are disposed in face-to-face relation (paragraph [0045]) and electrically connected to each other by way of conductive paste 6 disposed between aligned bond pads (paragraph [0051]).

Notably, the outermost semiconductor device 2, 3 of each pair has a larger area than the adjacent, inner semiconductor device 1, 4 of that pair. *See* FIG. 9. This arrangement leaves a bond pad on each semiconductor device 2, 3 laterally exposed beyond an outer periphery of the other semiconductor device 1, 4 of the stacked pair. The laterally exposed bond pad receives a bond wire 8 that electrically connects each semiconductor device 2, 3 to leads 9. As FIG. 9 clearly shows, the height of each bond wire 8 exceeds the distance that each pair of semiconductor devices 1 and 2, 3 and 4 is spaced apart from each other.

Independent claim 1, as amended and presented herein, is drawn to a semiconductor device that includes a semiconductor die and a dielectric spacer. The distance that the dielectric spacer protrudes from a surface the semiconductor die will accommodate a height of at least one laterally extending intermediate conductive element. Additionally, voids in the dielectric spacer communicate with a lateral periphery of the dielectric spacer.

It is evident from FIG. 9 of Nakanishi that the disclosure of Nakanishi is limited to semiconductor devices with spacers 24 that are configured to space two semiconductor devices 1 and 2, 3 and 4 apart from one another by a distance that is less than the heights of bond wires 8 protruding from surfaces of semiconductor device 2, 3. Therefore, the spacers 24 of Nakanishi do not protrude semiconductor devices 2 or 3 a sufficient distance to accommodate the heights of bond wires 8. Thus, under 35 U.S.C. §§ 102 and 103(a), the subject matter recited in amended independent claim 1 is allowable over the subject matter disclosed in Nakanishi.

Each of claims 2-10 and 17 is allowable, among other reasons, for depending directly or indirectly from claim 1, which is allowable.

Claim 2 is further allowable since Nakanishi lacks any teaching or suggestion that the polyimide spacer 24 thereof may include a plurality of laterally discrete spacers.

Claim 5 is also allowable since Nakanishi lacks any teaching or suggestion that the polyimide spacer 24 thereof may have a thickness that exceeds a height that at least one intermediate conductive element (e.g., bond wires 8a, 8b of FIG. 9) protrudes above the active surface of a semiconductor device 2, 3 to which the polyimide spacer is secured.

Claim 8 is additionally allowable because Nakanishi teach or suggest that the polyimide spacer 24 thereof comprises a pattern.

Claim 9 is further allowable since Nakanishi lacks any teaching or suggestion that the polyimide spacer 24 thereof comprises randomly arranged features.

Claim 17 is also allowable because Nakanishi does not teach or suggest that adhesive material may be present on an exposed surface of the polyimide spacer 24.

Independent claim 19 is drawn to a semiconductor device assembly that includes, among other things, a nonconfluent spacer layer that spaces an active surface of a first semiconductor device apart from a back side of a second semiconductor device.

In contrast to describing, teaching, or suggesting assemblies in which the back side of one semiconductor device faces the active surface of another semiconductor device, the disclosure of Nakanishi is limited to assemblies in which the active surfaces 1a and 2a, 3a and 4a of stacked pairs of semiconductor devices 1 and 2, 3 and 4 face each other. *See, e.g.,* Fig. 9; paragraphs [0077] and [0047]. Therefore, Nakanishi does not anticipate or render obvious the subject matter recited in independent claim 19. Therefore, under 35 U.S.C. §§ 102 and 103(a), the subject matter recited in independent claim 19 is allowable over the subject matter disclosed in Nakanishi.

Claims 20-26, 33, 37-39, and 42-44 are each allowable, among other reasons, for depending directly or indirectly from claim 19, which is allowable.

Claim 20 is also allowable since Nakanishi neither teaches nor suggests that the polyimide spacer 24 thereof includes at least one void that communicates with a lateral periphery of the polyimide spacer 24.

Claim 21, which depends from claim 20, is additionally allowable because Nakanishi does not teach or suggest that the polyimide spacer 24 includes a void that facilitates introduction of adhesive material between first and second semiconductor devices.

Claim 22 is further allowable since Nakanishi includes no teaching or suggestion that the polyimide spacer 24 thereof includes a plurality of laterally discrete spacers.

Claim 24 is additionally allowable because Nakanishi does not teach or suggest an assembly in which an intermediate conductive element is located at least partially between first and second semiconductor devices that are spaced apart from one another by the polyimide spacer 24 disclosed therein.

Claim 25 depends from claim 24 and is also allowable since Nakanishi lacks any teaching or suggestion that the polyimide spacer 24 thereof may space first and second semiconductor devices apart from one another a distance that exceeds a height that at least one intermediate

conductive element (e.g., bond wires 8a, 8b of FIG. 9) protrudes above the active surface of one of the semiconductor devices 2, 3.

Claim 33 is additionally allowable because Nakanishi teach or suggest that the polyimide spacer 24 thereof comprises a pattern.

Withdrawal of the 35 U.S.C. § 102/103(a) rejections of claims 1-10, 17, 19-26, 33, 37-39, and 42-44 is respectfully requested, as is the allowance of each of these claims.

Rejections under 35 U.S.C. § 103(a)

Nakanishi in View of Smith

Claims 11 and 12 are rejected under 35 U.S.C. § 103(a) for reciting subject matter which is assertedly unpatentable over that taught in Nakanishi, in view of teachings from U.S. Patent 6,049,370 to Smith, Jr. et al. (hereinafter "Smith").

Claims 11 and 12 are allowable, among other reasons, for depending from claim 1, which is allowable.

Nakanishi in View of Blanton

Claims 18 and 31 have been rejected under 35 U.S.C. § 103(a) for reciting subject matter which is allegedly unpatentable over the subject matter taught in Nakanishi, in view of teachings from U.S. Patent 5,220,200 to Blanton (hereinafter "Blanton").

Claim 18 is allowable, among other reasons, for depending from claim 1, which is allowable.

Claim 31 is allowable, among other reasons, for depending from claim 19, which is allowable.

Nakanishi in View of Mueller

Claims 11, 13, and 32 stand rejected under 35 U.S.C. § 103(a) for being directed to subject matter that is purportedly not patentable over the subject matter taught in Nakanishi, in view of the teachings of U.S. Patent 6,316,786 to Mueller et al. (hereinafter "Mueller").

Claims 11 and 13 are both allowable, among other reasons, for depending directly from claim 1, which is allowable.

Claim 32 is allowable, among other reasons, for depending directly from claim 19, which is allowable.

It is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 1-13, 17-26, 31-33, 37-39, and 42-44 be withdrawn, and that each of these claims be allowed.

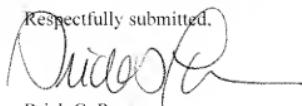
ELECTION OF SPECIES REQUIREMENT

Independent claim 1 remains generic to all of the species of invention that were identified in the Election of Species Requirement in the above-referenced application. In view of the allowability of these claims, claims 14-16, 27-30, 34-36, 41, and 45-67, which have been withdrawn from consideration, should also be considered and allowed. M.P.E.P. § 806.04(d).

CONCLUSION

It is respectfully submitted that each of claims 1-39 and 41-67 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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